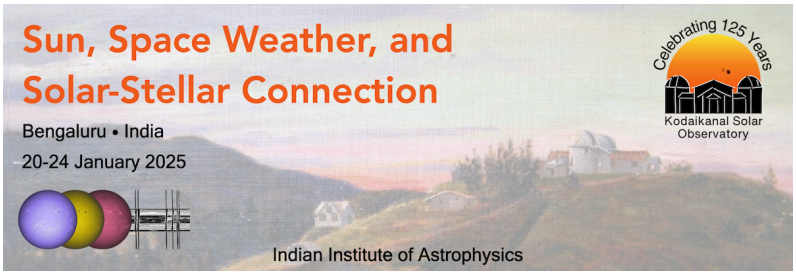

Contribution ID: **175** Type: **Poster**

Periodicity in the Ratio of Sunspot Number to the Sunspot-group Area

The solar dynamo, believed to operate near the base of the convection zone (BCZ), generates the magnetic fields responsible for solar activity and solar cycles. Magnetic structures (flux tubes) formed near BCZ rise through the convection zone, potentially fragmenting/branching into smaller structures. These structures emerge as sunspots or active regions/sunspot groups on the Sun's surface. This process vary with time and latitude, depending on the solar cycle phase and other timescales. In this study, we analyze sunspot data from Kodaikanal Observatory (1904-2017) to examine variations in the ratio of the 13-month smoothed international sunspot number (SN) to the average sunspot group area (A). A large/small SN/A may imply the fragmentation process is less/more. We apply fast Fourier transform (FFT) and Morlet wavelet analysis to study periodicities in the SN/A ratio. We find besides ~11-year periodicity, ~67, 63, 60, 45 year periodicities in SN/A. These results, combined with variations in other solar activity indices, help deepen our understanding of solar variability and the underlying processes driving magnetic field evolution.

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Theme

Solar Magnetism over Long-Time Scales

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